

In the claims:

Following is a complete set of claims as amended with this Response.

1-18. (Canceled)

19. (Currently Amended) An external payload launch system comprising:
a launch vehicle having an interior and an exterior;
a motor to boost the launch vehicle into an exoatmospheric flight path;
a primary payload compartment in the launch vehicle interior to carry a primary payload;
a primary fairing to protect the payload compartment;
a secondary payload mounted to the exterior of the launch vehicle, the secondary payload having a mass less than one tenth the mass of the primary payload; and
a release mechanism to separate the secondary payload from the launch vehicle during the launch vehicle's flight.

20. (Original) The system of Claim 19, wherein the secondary payload is mounted to the exterior of the primary fairing.

21. (Original) The system of Claim 19, further comprising a power supply in the launch vehicle interior coupled to the secondary payload to support the secondary payload.

22. (Original) The system of Claim 19, further comprising command control and telemetry components in the launch vehicle interior coupled to the secondary payload to support the secondary payload.

23. (Original) The system of Claim 19, further comprising a secondary fairing mounted to the exterior of the launch vehicle to protect and contain the secondary payload in flight, and wherein the release mechanism releases the secondary payload from within the secondary fairing.

24-48. (Canceled)

49. (Previously Presented) The system of Claim 23 further comprising a mounting adapter to attach the fairing to the exterior surface of a launch vehicle.

a release mechanism to separate the payload from the launch vehicle out of the fairing cavity during the launch vehicle's flight.

50. (Previously Presented) The system of Claim 49, wherein the mounting adapter is an integral part of the secondary fairing.

51. (Previously Presented) The system of Claim 49, wherein the mounting adapter is an integral part of the secondary payload.

52. (Previously Presented) The system of Claim 49, wherein the secondary fairing is mounted to the mounting adapter which is mounted to the exterior surface of the launch vehicle.

53. (Previously Presented) The system of Claim 49, wherein the mounting adapter comprises a discrete plate with a plurality of attachment points.

54. (Previously Presented) The system of Claim 23, wherein the secondary fairing comprises a monocoque graphite-epoxy structure.

55. (Previously Presented) The system of Claim 23, wherein the release mechanism deploys the payload by releasing the payload from within the secondary fairing.

56. (Previously Presented) The system of Claim 19, wherein the release mechanism comprises one or more non-explosive actuators.

57. (Previously Presented) The system of Claim 19, further comprising a sequencer to initiate payload deployment by the release mechanism.

58. (Previously Presented) The system of Claim 19, further comprising an environmental sensor to initiate payload deployment by the release mechanism based on a parameter sensed by the environmental sensor.

59. (Previously Presented) The system of Claim 19, wherein the release mechanism deploys the payload in response to an external command.

60. (Previously Presented) The system of Claim 19, wherein the release mechanism comprises an ejection mechanism for ejecting the payload.

61. (Previously Presented) The system of Claim 60, wherein the ejection mechanism comprises guide rails and springs.

62. (Previously Presented) The system of Claim 23, wherein the release mechanism deploys the secondary payload by releasing the payload from within the secondary fairing in a direction opposite the direction of travel of the launch vehicle.

63. (Previously Presented) The system of Claim 23 further comprising a port coupled to the release mechanism and opened by the release mechanism during deployment of the secondary payload to allow the secondary payload to exit the secondary fairing.

64. (Previously Presented) The system of Claim 19, further comprising an umbilical cable to connect the secondary payload to components within the launch vehicle interior.

65. (Previously Presented) The system of Claim 64, wherein the umbilical cable is adapted to provide power, commands and telemetry to the secondary payload.

66. (Previously Presented) The system of Claim 64, wherein the umbilical cable is adapted to provide power, and commands to the release mechanism.

67. (Previously Presented) The system of Claim 19, further comprising a secondary fairing to protect the payload, and a mounting interface to attach the secondary payload, secondary fairing and release mechanism to the exterior surface of the launch vehicle.

68. (Previously Presented) The system of Claim 67, wherein the mounting interface is integrated with the secondary fairing.

69. (Previously Presented) The system of Claim 67, wherein the mounting interface is integrated with the secondary payload.

70. (Previously Presented) The system of Claim 67, wherein the secondary fairing is mounted to a mounting adapter which is attached to the exterior surface of the launch vehicle through the mounting interface.

71. (Previously Presented) The system of Claim 67, wherein the secondary fairing has an internal cavity to contain the secondary payload and wherein the release mechanism separates the secondary payload by releasing the secondary payload from within the secondary fairing.

72. (Previously Presented) The system of Claim 23, wherein the release mechanism moves the secondary fairing to expose the secondary payload.

73. (Previously Presented) The system of Claim 23, wherein the release mechanism separates the secondary fairing from the launch vehicle with the secondary payload.

74. (Previously Presented) The system of Claim 23, wherein the release mechanism moves the secondary fairing to expose the secondary payload.
75. (Currently Amended) A method comprising:
mounting a secondary payload to an exterior of a launch vehicle, the launch vehicle carrying a primary payload in a primary payload compartment of the launch vehicle interior, the secondary payload having a mass less than one tenth the mass of the primary payload, the primary payload compartment being protected by a primary fairing;
boosting the launch vehicle into an exoatmospheric flight path using a motor; and
separating the secondary payload from the launch vehicle during the launch vehicle's flight using a release mechanism.
76. (Previously Presented) The method of Claim 75, further comprising setting a release mechanism to separate the secondary payload from the launch vehicle exterior during flight.
77. (Previously Presented) The method of Claim 75, wherein separating comprises receiving a trigger signal from components inside the launch vehicle to start an ejection sequence.
78. (Previously Presented) The method of Claim 77, wherein the ejection sequence ejects the secondary payload.
79. (Previously Presented) The method of Claim 77, wherein the secondary payload is contained within the secondary fairing and wherein the ejection sequence ejects the secondary fairing with the secondary payload.
80. (Previously Presented) The method of Claim 75, wherein the secondary payload is contained within the secondary fairing and wherein separating comprises opening a port through which the secondary payload exits the secondary fairing.
81. (Previously Presented) The method of Claim 75, wherein mounting a secondary payload comprises mounting a secondary fairing to the exterior surface of the launch vehicle and attaching the secondary payload within a protected cavity of the secondary fairing.